

CLAIMS

1. An electronic blood pressure monitor (10) having a cuff (12) attached on a subject and pressurized and depressurized to measure said subject's blood pressure,
5 comprising:

pulse wave detection means (15, 17, 18) detecting said subject's pulse wave as said cuff occludes said subject;

mean blood pressure estimation means (191) estimating said subject's mean blood pressure from said pulse wave detected by said pulse wave detection means;

10 diastolic blood pressure detection means detecting said subject's diastolic blood pressure (DBP); and

a systolic blood pressure calculator (21) calculating said subject's systolic blood pressure from said estimated mean arterial pressure (EMAP), said diastolic blood pressure (DBP) detected and said pulse wave's waveform.

15 2. The blood pressure monitor of claim 1, wherein:

said pulse wave detection means includes waveform parameter calculation means (18) calculating a waveform parameter indicative of a feature of a waveform of a pulse wave detected, and said diastolic blood pressure detection means includes diastolic
20 blood pressure calculation means (24) using said waveform parameter to calculate diastolic blood pressure (DBP);

said mean blood pressure estimation means employs said waveform parameter to determine a reference pressure point within any range of no more than a systolic blood pressure to no less than a diastolic blood pressure and with reference to said reference
25 pressure point calculates estimated mean arterial pressure (EMAP) by using said waveform parameter correlated with an average value of intra-arterial pressure waveform; and

said systolic blood pressure calculator correlates said diastolic blood pressure

(DBP) and said estimated mean arterial pressure to said pulse waveform's maximum and average values and calculates a blood pressure corresponding to said pulse waveform's maximum value point to determine systolic blood pressure (SBP).

5 3. The blood pressure monitor of claim 2, further comprising waveform distortion correction means (251) correcting said waveform parameter to cancel an error (65) introduced by a distortion of a detected pulse wave relative to said intra-arterial waveform into systolic blood pressure calculated.

10 4. The blood pressure monitor of claim 3, wherein said waveform distortion correction means (251) makes a correction based on a waveform parameter (ΔA_{mr}) representative of a relationship between intra-arterial pressure and vascular volume obtained when said cuff effects occlusion.

15 5. The electronic blood pressure monitor of any of claims 2-4, wherein said mean blood pressure estimation means determines as said estimated mean arterial pressure (EMAP) a cuff pressure (P_{cmax}) allowing a pulse wave amplitude (A_m) to be maximized.

20 6. The electronic blood pressure monitor of any of claims 2-4, wherein said mean blood pressure estimation means uses an area of an apical portion (72) of a pulse wave amplitude envelope (71) to perform an operation to determine said estimated mean arterial pressure (EMAP).

25 7. The electronic blood pressure monitor of any of claims 2-4, wherein said mean blood pressure estimation means uses a waveform parameter (RT_s) indicative of stiffness in a vicinity of a pulse wave rising point to determine said estimated mean arterial pressure (EMAP).

8. The electronic blood pressure monitor of any of claims 2-4, further comprising flat-amplitude detection means (192) detecting whether there exists a cuff pressure range free of significant variation in pulse wave amplitude when said cuff pressure is changed, wherein:

when said flat amplitude detection means (192) detects that in a cuff pressure range free of significant variation in pulse wave amplitude there exists estimated mean arterial pressure (EMAP) corresponding to a maximized pulse wave amplitude, this is discarded; and

systolic blood pressure (SBP) is determined from one or both of estimated mean arterial pressure (EMAP) obtained by an operation based on an area of an apical portion (72) of said pulse wave amplitude envelope (71) and estimated mean arterial pressure (EMAP) obtained as based on a waveform parameter (RTs) indicative of stiffness in a vicinity of a pulse wave rising point.

9. The electronic blood pressure monitor of any of claims 2-4, wherein said systolic blood pressure calculator calculates systolic blood pressure (SBP) for each pulse wave of a plurality of pulses obtained during measurement and provides an average of such obtained systolic blood pressures as an ultimate systolic blood pressure (SBP).

10. The electronic blood pressure monitor of any of claims 2-4, further comprising a pulse wave average calculator calculating average values of a plurality of pulse waves, respectively, detected by said pulse wave detection means, wherein said systolic blood pressure calculator calculates systolic blood pressures for said plurality of pulse waves, respectively, from said average values calculated by said pulse wave average calculator, and determines an average of these calculated systolic blood pressures as an ultimate systolic blood pressure (SBP).

11. The electronic blood pressure monitor of any of claims 2-4, wherein said systolic blood pressure calculator calculates a systolic blood pressure for each pulse waveform of a plurality of pulses obtained during measurement, classifies such results into a plurality of classes (142, 143) within a range of a cuff pressure being applied when a pulse wave is generated, and performs an operation weighting an average value (SBP1, SBP2) of each class to determine a systolic blood pressure to be a result of the measurement.

12. The electronic blood pressure monitor of any of claims 2-4, further comprising blood pressure variation range display means (22) calculating a systolic blood pressure for each pulse wave of a plurality of pulses obtained during measurement, and displaying how a plurality of systolic blood pressures vary in value.

13. A blood pressure measurement method employing an electronic blood pressure monitor having a cuff attached on a subject and pressurized and depressurized in order to measure the subject's blood pressure, comprising the steps of:

detecting (ST2, ST3) a pulse wave of the subject occluded by said cuff;
estimating (ST4) the subject's mean blood pressure from a pulse wave detected;
detecting (ST6) the subject's diastolic blood pressure (DBP); and

calculating (ST9) the subject's systolic blood pressure (SBP) from an estimated mean arterial pressure (EMAP), the detected diastolic blood pressure (DBP) and the detected pulse wave's waveform.